APPLICATION

FOR

UNITED STATES LETTERS PATENT

ENTITLED

DISTRIBUTED SEARCH SYSTEM AND METHOD

TO WHOM IT MAY CONCERN:

BE IT KNOWN THAT DR. LARRY R. HARRIS of 94 Annursnac Hill Road, Concord, MA 01742 invented certain new and useful improvements entitled as set forth above of which the following is a specification:

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DISTRIBUTED SEARCH SYSTEM AND METHOD

CLAIM OF PRIORITY

This application claims priority to U.S.S.N. 60/221,546 entitled "Distributed Natural Language Search Method", naming Larry R. Harris as inventor, and filed on 28 July 2000, the contents of which are herein incorporated by reference in their entirety.

BACKGROUND

(1) Field

The systems and methods relate generally to search systems and methods, and more particularly to efficiently locating and accessing information across a communications network such as the internet.

(2) Description of Related Art

The internet provides a single conduit to reach a supplier of a product or information that can be located, in some cases, throughout the world. One challenge for internet customers or consumers, and hence internet businesses, is knowing the suppliers to contact, and how to gain proper access to the suppliers. The success of commerce on the internet therefore

depends on customers' ability to locate products and/or information easily and quickly; however, industry statistics indicate that over seventy percent of potential customers to internet websites leave the websites without finding their desired product(s)/information. This result is not desirable for the website in generating profits directly through internet sales, or indirectly through advertising revenue.

First generation techniques for finding products and/or information on the internet were advertiser-based and listed websites, rather than individual products. Second generation techniques involved aggregating product and other information from multiple supplier sites (product catalogs) at online shopping malls or business-to-business "vortals" to allow consumers to access consolidated listings across multiple suppliers. It is anticipated that the next generation supplier networks may dynamically access information from relevant suppliers in response to a buyer's requirements and present only the suppliers and products that precisely meet the consumers' needs.

SUMMARY

The present disclosure provides a system and method for performing a search of data sources that can reside on a network such as the internet. The search can be specific to the content

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and organization of the data sources. The search can also be a
distributed search to multiple data sources. Data sources can
include textual documents such as web pages that can include
program instructions, and other types of text documents, text
files, and databases, although other data sources can be
included. The data sources can reside on one or more servers or
other devices on a network. Searches or queries can be initiated
using natural language expressions, sentences, keywords, or
combinations thereof, from which data source content-specific
queries can be generated and executed. In some embodiments, a
dynamically generated customized query can be formed and issued
for each data source to be searched or queried.

In one embodiment, the methods and systems can provide an
application that can be installed on a subscriber's server to
allow a website and/or other data sources accessible to the
server, to be searched without requiring pre-integration,
reformatting, etc. of the server or the data on the server. In
another embodiment, the application can reside on another device
or server that can be in communication with the subscriber's
website server. For the purposes of the methods and systems
described herein, a "website" can be understood to include a
document on a network such as the internet or an intranet, that
can include a home page and other documents and files that can be
accessed through the webpage either directly or indirectly, and

1	the website can also include databases that can be accessed
2	directly or indirectly. The application can develop a customized
3	query for the website and/or other data sources accessible to the
4	server, using wired or wireless communications systems and
5	protocols.
6	When a subscriber maintains a product catalog database, for
7	example, the installed application can access the database and
8	build a customized dictionary that can convert a natural language
9	or keyword search query to a precise SQL query for the
10	subscriber's product catalog database. Additionally and
11	optionally, if the target of the search is text, the installed
12	application can build a custom dictionary can generate an
13	advanced text search of the website using one or more standard
14	text search engines that may be otherwise installed at or
15	available to the website.
16	In some embodiments, the methods and systems can allow an
17	internet user or other internet accessible entity, including non-
18	human entities, to initiate a search from, for example, a
19	website. Such a website can hereinafter be referred to as an
20	initiating website, and can be the network location from which
21	the search can be broadcast or distributed to subscriber websites
22	and hence, customized dictionaries. In one embodiment, the
23	customized dictionaries can receive a HTTP command and thereafter
24	reach behind security measures such as firewalls to access

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otherwise protected or secure data. The systems and methods can also allow subscribers to receive a search command or query information from the initiating website, utilize the subscriber's local customized dictionary to translate the search for the respective website, data source, etc., initiate a customized search of the subscriber's website, data source, etc., and extract the relevant information for submission as search results to the initiating website. In one embodiment, the search can be an SQL search or a text search.

In one embodiment, the application at a particular subscriber's server can immediately determine from the received search command and the customized dictionary, that a search may not be necessary because the website and/or data source may not include relevant information, products, services, etc.

In an embodiment, the search results from subscribers can be formatted in XML, and the initiating website can receive the multiple search results and integrate the XML results for presentation to a user at the initiating site. The results can also be formatted for presentation by email, instant messaging, or for voice. In some embodiments, the query can be submitted by email, instant messaging, or voice.

The methods and systems can produce search results that can include a subscriber (supplier) name, a product name or identifier, a product price, a product description, a product

image, etc. In one embodiment, the user's (or querying entity's)
selection of a product can provide a transition to an order
basket that can be at the initiating website, the subscriber's
website, or an alternate website. In one embodiment, search
results can be accompanied by a URL of the order processing
system that can be used to order the product; and, when the user
selects the item, the relevant product information can be
submitted to the purchasing system to initiate the purchase
process.

The methods and systems can allow a subscriber to access and
search a cooperating subscriber's website and products in a peer-
to-peer relationship.

The methods and systems can accommodate customized searches.
Accordingly, a user can establish an account or profile that can
be transmitted or otherwise associated with the search or query
request from the initiating device or website. The user's
profile can be incorporated into the customized searches at the
subscriber websites. In one embodiment, the user can transmit
the profile with the query information or search request, while
in another embodiment, the user can be identified at the
initiating device or website by an account number that can allow
access to a locally or centrally stored profile for submission
with the inquiry. In yet another embodiment, a user can submit
or otherwise be associated with a profile such that subscribers

1   can customize a search or query based on the user profile and/or

2   identity.

3   The methods and systems can allow a user to customize the

4   presentation of search results. For example, a user can select

5   an option to view search results by price. In an embodiment, a

6   subscriber can customize or otherwise control the search results.

7   For example, a subscriber may not produce a search result for a

8   particular product unless the inventory level for that product

9   exceeds a particular value.

10   In one embodiment, subscribers can update respective

11   customized dictionaries to produce more accurate searches that

12   can reflect changes in terminology, etc. In an embodiment, a

13   dictionary can be updated locally or remotely via a wired or

14   wireless network.

15   The methods and systems can allow hierarchical searching of

16   multiple servers and/or data sources using a "broker" dictionary

17   that can receive query information and/or a search request from

18   the initiating website or device, and broadcast the request to

19   several other customized dictionaries, known as broadcast

20   dictionaries, that can be located, for example, on various

21   subscribers' servers. The broker dictionary can receive and

22   compile search results from broadcast dictionaries, and transfer

23   a single, composite search result to the initiating website. The

24   broker dictionary can be utilized as an intelligent filter to

1   intelligently select only specific broadcast dictionaries that

2   may be more likely to produce relevant search results.

3   In an embodiment, the methods and systems can identify

4   customized dictionaries using a URL that can allow a remote

5   server to access the dictionary, create a local copy, modify the

6   copy, and transmit the modified copy to the original location for

7   re-writing, etc.

8   Other objects and advantages will become apparent

9   hereinafter in the specification and drawings.

10

BRIEF DESCRIPTION OF THE DRAWINGS

12   FIG. 1 displays an architectural block diagram of a system

13 that practices the principles of the methods and systems

14 described herein for a single data source;

15   FIG. 2 displays systems and methods according to FIG. 1 for

16 an exemplary internet embodiment;

17   FIG. 3 displays systems and methods according to FIG. 1 for

18 an exemplary query translation architecture;

19   FIG. 4 displays systems and methods according to FIG. 1 for

20 an exemplary architecture providing query translation and

21 retrieval;

22   FIG. 5 displays systems and methods according to FIG. 1 for

23 an exemplary query translation, retrieval, and presentation

24 architecture; and,

FIG. 6 is a diagram representing systems and methods in
accordance with the principles of FIG. 1 that include a broker
dictionary.

DESCRIPTION

To provide an overall understanding, certain illustrative
embodiments will now be described; however, it will be understood
by one of ordinary skill in the art that the systems and methods
described herein can be adapted and modified to provide systems
and methods for other suitable applications and that other
additions and modifications can be made without departing from
the scope hereof.

Referring now to FIG. 1, there is a block diagram of a
system **100** that implements the techniques described herein. As
will become apparent herein, the techniques as described in
relation to FIG. 1 have many applications and embodiments, some
of which can be referenced herein with respect to other figures.
FIG. 1, and other Figures provided herein, can therefore be
understood to represent the techniques, and while pictorial
objects can be represented in the Figures, those with ordinary
skill in the art will understand that these pictorial objects can
be provided for understanding only and are not intended to be a

1   limitation on the methods and systems. Accordingly, pictorial

2   objects and their associated concepts can be combined with other

3   pictorial objects, or additionally and optionally, separated into

4   further pictorial objects, while not departing from the methods

5   and systems.

6   As FIG. 1 indicates, the techniques herein can be initiated

7   by a survey **102** of a data source **20**. The survey can be automated

8   or manually guided to identify data sources **20**. As will be

9   understood herein, data sources can include one or more textual

10   documents, databases, etc., where a textual document can be

11   understood to include a text file, web page, etc., that can be

12   formatted text such as HTML, XML, some other SGML format, or

13   another text format. A data source that is a database can use a

14   format compatible with MySQL, SQL, Oracle, Informix, Sybase, the

15   Freedom Engine, Access, ODBC, DB2, etc. Those with ordinary

16   skill in the art will recognize that the methods and systems are

17   not limited to the type or format of the data sources. Through

18   the survey **102**, the data source(s) can be analyzed with regard to

19   data format, data type, data organization (e.g., categorization,

20   hierarchical structure), relevant terms and phrases,

21   relationships between words, terms, and phrases, identification

22   of abbreviations or word/phrase variations, codes related to data

1   (purchase codes, product codes, price codes, or any other code

2   that can relate to categorizing the product in terms of price,

3   demographic appropriateness or characteristics, etc.) etc. Other

4   information related to the data source can be manually provided.

5   In some embodiments, the survey can be automated, and additional

6   information including the number of data sources, etc., can be

7   determined. For the purposes of illustration with respect to the

8   embodiment of FIG. 1, a database data source **20** is illustrated,

9   although such an example is provided for illustration and not

10 limitation, and multiple and varied format data sources,

11 including textual data sources, can be utilized for the methods

12 and systems.

13   A dictionary **18** can be formulated **104** based on the survey

14 results **102**. The dictionary **18** can be understood to be, for

15 example, a computer program that can be implemented in a higher

16 level language such as C, C++, Java, etc., that can receive query

17 information as input, and can provide as output, a query

18 formatted and otherwise customized for the data source.

19   Referring again to FIG. 1, query information **106** can be

20 received by the dictionary **18**. Although FIG. 1 illustrates only

21 one dictionary **18**, it can be understood that there can be

multiple dictionaries, and in such embodiments, the query

information **106** can be received by the multiple dictionaries.

The illustrated dictionary **18** can generate a customized query **110**

based on the received query information **106** and the survey

results. The customized query **110** can be applied to the data

source **20** from which the survey was conducted. The customized

query results **112** can, in some embodiments, be returned to the

dictionary **18**. In some embodiments, the dictionary **18** can

format, arrange, aggregate, etc., the customized query results

112 and transfer or forward the results. For example, the query

results **108** can be transferred to the entity that requested that

supplied the query information **106**, or another entity can be

designated or otherwise specified to receive the query results

108. As indicated previously herein, FIG. 1 illustrates the

principles of the methods and systems which have wide

applicability.

Referring now to FIG. 2, there is an architectural block

diagram **10** of an illustrative system that utilizes the methods

and systems for an internet application. The FIG. 1 system

indicates an initiating device **12** that can include a digital

computer system that can utilize a wired or wireless

communications link to connect to a communication network such as

the internet. A user of the initiating device 12 can utilize

different peripheral devices that can be integrated with or

otherwise configured for compatible use with the initiating

device 12. For example, the initiating device 12 can include a

keyboard, keypad, stylus, digital camera, microphone, etc., that

can communicate data to the initiating device using wired or

wireless communications systems and/or protocols, etc. The

initiating device 12 can be a microprocessor-based system

including a computer workstation, such as a PC workstation or a

SUN workstation, handheld, palmtop, laptop, personal digital

assistant (PDA), cellular phone, etc., that includes a program

for organizing and controlling the initiating device 12 to

operate as described herein. Additionally and optionally, the

initiating device 12 can be equipped with a sound and video card

for processing multimedia data. The initiating device 12 can

operate as a stand-alone system or as part of a networked

computer system. Alternatively, the initiating device 12 can be

dedicated devices, such as embedded systems, that can be

incorporated into existing hardware devices, such as telephone

systems, PBX systems, sound cards, etc. Accordingly, it will be

understood by one of ordinary skill in the art that the

13

1   initiating device **12** described herein has wide applicability and

2   can be incorporated in many systems, and realized in many forms.

3   For a system according to FIG. 1, the initiating device **12**

4   can be connected to a network such as the internet and can be

5   equipped with what is well-known as an internet "browser" such as

6   the commercially available Netscape Navigator, Internet Explorer,

7   etc., browsers, and those with ordinary skill in the art will

8   recognize that, depending upon the initiating device **12** and its

9   configuration, the browser can differ, and hence references

10   herein to a browser can include references to a user interface to

11   the internet or other network, wherein the methods and systems

12   herein are not limited to the browser or other network interface.

13   Furthermore, the initiating device **12** can access the internet

14   using wired or wireless communications links and/or protocols.

15   The initiating device **12** can communicate with a server that

16   can be represented in the FIG. 1 system as a System Server **14**.

17   The illustrated server **14** can be also be a microprocessor-based

18   system including a computer workstation, such as a PC workstation

19   or a SUN workstation, handheld, palmtop, laptop, personal digital

20   assistant (PDA), cellular phone, etc., that includes a program

21   for organizing and controlling the server **14** to operate as

14

1   described herein. Additionally and optionally, the server **14** can

2   be equipped with a sound and video card for processing multimedia

3   data. The server **14** can operate as a stand-alone system or as

4   part of a networked computer system. Alternatively, the server

5   **14** can be dedicated devices, such as embedded systems, that can

6   be incorporated into existing hardware devices, such as telephone

7   systems, PBX systems, sound cards, etc. In some embodiments,

8   servers can be clustered together to handle more traffic, and can

9   include separate servers for different purposes such as a

10   database server, an application server, and a Web presentation

11   server. The server **14** can also include one or more mass storage

12   devices such as a disk farm or a redundant array of independent

13   disk ("RAID") system for additional storage and data integrity.

14   Read-only devices, such as compact disk drives and digital

15   versatile disk drives, can also be connected to the server **14**.

16   As used herein, the term "server" is intended to refer to any of

17   the above-described servers. In an embodiment, the initiating

18   device **12** and the server **14** can be similar systems.

19   In an embodiment of the FIG. 1 system, the initiating device

20   **12** can access the server **14** via the internet, and the server **14**

21   can provide a webpage or other interface to the initiating device

22   **12** to allow a user of the initiating device **12** to input data

1   indicative of a query for information. Those with ordinary skill

2   in the art will recognize that this query information can be of

3   varying formats, and can include one or more keywords and/or

4   natural language terms or expressions that can optionally be

5   linked using one or more logical operators, including boolean

6   expressions or notations such as "and", "or", and "not". In some

7   embodiments, additionally and optionally, "+" and "-" can be used

8   to indicate desired and undesired terms, respectively, for

9   example. Those with ordinary skill in the art will recognize

10   that there are many different connectors and methods of relating

11   keywords, sentences, questions, and/or natural language words or

12   expressions that can be used.

13   For the purposes of the discussion herein, natural language

14   can be understood to be a word, phrase, grouping of words, etc.,

15   in a language written or spoken by humans.

16   Additionally and optionally, the query information can

17   include a full text statement or question or other natural

18   language data. The query information can be entered to the

19   initiating device **12** and thereafter edited using one or more of

20   multiple peripheral devices connected to the initiating device

21   that can include a keyboard, keypad, stylus, mouse, microphone,

etc., wherein those of ordinary skill in the art will recognize

that the methods and systems herein are not limited to the

mechanism of inputting query information to the initiating device

12. Furthermore, the methods and systems are not limited to the

format of inputting the query information or a user interface

that can be provided to facilitate such entry. For example, in

some embodiments, the query information can be input using one or

a combination of text input boxes, text documents, menu

selections, drop-down boxes, radio buttons, etc. The illustrated

initiating device **12** also can provide a user with the ability to

initiate the search, and in one embodiment, search initiation can

be understood as entering the query information.

Furthermore, the query information can be entered by a

variety of formats, including human users that can utilize

peripheral devices and/or integrated software to enter and/or

retrieve data by, for example, a keyboard, stylus, voice

commands, etc. In some embodiments, the query information can

additionally and optionally be provided by automated and/or non-

human sources using scripts or other programming techniques.

Accordingly, references herein to a user of the initiating device

12 can be understood to include any entity, human or non-human,

17

1   that can cause query information to be provided to the initiating

2   device **12**.

3   Upon initiation of a search or query by a user of the

4   initiating device **12**, for the FIG. 1 system, the initiating

5   device **12** can transfer the query information to the server **14**

6   that can include a list of subscribers that can be included, in

7   one embodiment, in a database **13**. The subscriber database **13** can

8   be accessed locally or through a network such as the internet

9   using wired or wireless communications devices and protocols.

10   The subscriber database **13** can be understood to include a memory

11   having one or more physical or logical partitions and/or

12   segments, and can optionally and additionally utilize one or more

13   of well-known database packages including MySQL, SQL, Oracle,

14   Informix, Sybase, the Freedom Engine, Access, ODBC, DB2, etc.,

15   with such examples provided for illustration and not limitation.

16   In an embodiment, the database **13** can reside in a memory of the

17   server **14**.

18   In an embodiment, the server **14** can access subscriber

19   information from the database **13** to cause the query information

20   to be distributed to one or more subscribers **16a, 16b, 16c**. In

21   the illustrated system, the database **13** can include URLs of

subscriber servers **16a, 16b, 16c** (also referenced herein

collectively or individually as **16**). The query information can

be transferred, distributed, or otherwise communicated to the

subscriber servers **16** simultaneously as in a broadcast, or using

an ordered scheme that can include network or load balancing

schemes. The FIG. 1 system illustrates the communication of

query information to three subscribers **16a, 16b, 16c** although the

methods and systems can be applied to one or more subscribers and

the number of subscribers is not a limitation. For an embodiment

wherein the system server **14** communicates to the subscriber

servers **16** via a network such as the internet, the transfer of

the query information can be performed using HTTP or HTTPS, for

example, although such an example is provided for illustration

and not limitation.

The illustrated subscribers **16a, 16b, 16c** can be servers as

described previously herein with respect to the System Server **14**.

The servers **16** can include one or more data sources **20a, 20b,**

20c, 20d (also referenced herein collectively or individually as

20). The subscribers **16** also include a dictionary **18a, 18b, 18c,**

18d (also referenced herein collectively or individually as **18**)

that can be associated with and based on the data sources **20a,**

20b, 20c, 20d. In an embodiment such as that of FIG. 1, a data

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1   source **20** can be associated with a dictionary **18**, although in

2   some embodiments, one dictionary **18** can be associated with more

3   than one data source **20**. Alternately, in an embodiment, one data

4   source **20** could be associated with more than one dictionary **18**.

5   For the illustrated systems and methods, as described

6   previously herein, a dictionary **18** can be understood to be a

7   translator between the received query information, received from

8   the System Server **14** as described herein, and a data source **20**.

9   For the illustrated systems where one dictionary **18** corresponds

10   to a data source **20**, a dictionary **18** can be formed by installing

11   a computer program on the subscriber server **16**. In an

12   embodiment, the computer program can be run from a remote

13   location via a network. As indicated previously, in some

14   embodiments, the survey computer program can be understood as a

15   survey engine that examines the data sources **20** on the server **16**.

16   As indicated previously, the dictionary **18** can incorporate the

17   survey engine results to provide a customized interface between

18   received query information, and the data source **20**.

19   For example, if the data source **20** is a database, the survey

20   engine can identify labels of tables, rows, and columns, and

21   abbreviations of labels, when necessary. This survey information

1   can be incorporated into a dictionary **18** to allow received query

2   information to be properly translated for the database. In the

3   case of a database, query information from a user of the

4   initiating device **12** can be an input to a dictionary **18**, and the

5   dictionary output can be a customized SQL query that uses

6   terminology, abbreviations, etc., derived from the survey engine.

7   In some embodiments, the dictionary output can be a customized

8   HTTP search string that can utilize a general access method that

9   can be created for the data source (e.g., the HTTP search string

10   can be formatted based on drop-down menus/boxes, radio button

11   selections, and/or other general access provisions). In an

12   example of a database embodiment, a database can be configured

13   with columns or rows that relate to colors that are abbreviated,

14   such as "Rd" for Red, "Bl" for Blue, etc. If query information

15   is submitted with the word "Blue", the customized dictionary can

16   cause a customized query to be formatted using "Bl" according to

17   the survey information. Accordingly, row information and column

18   information can be understood herein to include a

19   characterization of the database information that can include

20   header information, element information, extraneous information

21   that can otherwise provide insight to the database, etc.

1   Additionally and optionally, when the data source **20** is

2   text, the survey engine can scan the text, identify synonyms,

3   abbreviations, etc., for incorporation into a dictionary **18**. A

4   dictionary for a text data source **20** can format received query

5   information into an advanced text query that can utilize a

6   standard text engine. Some examples of standard text engines can

7   include AltaVista, Excite, Google, Infoseek, Inktomi, Microsoft

8   Index Server, etc., although such examples are provided for

9   illustration and not limitation. Optionally and additionally,

10   the dictionary can convert the received query information into a

11   HTTP query that can be formatted according to a web page on the

12   server **16**, where the web page can include text input boxes, radio

13   buttons, drop-down boxes, check-boxes, etc.

14   The illustrated dictionaries **18** can also include a natural

15   language and linguistic processor that is well-known in the art

16   for parsing received information, performing context analysis,

17   generating synonyms, etc. The dictionaries **18** also include a

18   spell corrector that can verify word spellings and generate

19   phonetic equivalents, although such features can reside

20   independent of the spell corrector. The dictionaries **18** can also

21   perform word variations to better interpret and/or distinguish

22   words, for example, between similar words such as "build",

1   "builder", and "building." Furthermore, the dictionaries **18** can

2   perform phrase identification that includes identifying word

3   groups within context. For example, "wrinkle-free" can be

4   interpreted with respect to clothes, or in another manner with

5   respect to plastic surgery. Accordingly, it can be understood

6   that the dictionaries **18** for the illustrated systems and methods

7   can extend the received query information to include terminology

8   that is compatible with, understood by, and/or interpreted by a

9   data source **20** to which the dictionary **18** corresponds.

10   A dictionary **18** can be equipped with a foreign language

11   translator to convert received query information from one

12   language, to another language that is compatible with the data

13   source **20**. In some embodiments, a dictionary **18** can be

14   established for different languages, while in another embodiment,

15   a single dictionary **18** can translate queries for multiple

16   languages.

17   A dictionary **18** can determine that received query

18   information from the initiating device **12** is not compatible with

19   the data source **20** or otherwise cannot be interpreted. In an

20   embodiment, the dictionary **18** can generate a list of possible

21   interpretations for a user of the initiating device **12** to select.

23

1   Additionally and optionally, the dictionary **18** can cause the

2   initiating device **12** to provide a user with a request for

3   additional, alternate, or restated query information.

4   A dictionary **18** can also identify a Frequently Asked

5   Question (FAQ) and supply either a pre-defined answer to a user

6   at the initiating device **12**, or redirect the user to, for

7   example, a web page that includes an answer. A dictionary **18** can

8   also recognize and respond appropriately to query information

9   that seeks a "yes" or "no" answer, time-based queries using date

10 or time terminology including "now", "last month", "before",

11 "between", etc., and arithmetic queries that can include

12 mathematical concepts such as "lowest-priced", "top 5", "less

13 than", etc.

14 In the illustrated systems and methods, results of a

15 customized data source search can be provided to a dictionary **18**,

16 and the dictionary **18** can thereafter organize, format, etc., the

17 search results for return to the initiating device **12**. The

18 information can be presented via the subscriber server **16** to the

19 System Server **14** and hence to the initiating device **12**, or

20 directly from the subscriber server **16** to the initiating device

21 **12**. In one embodiment, the search results can be formatted in

1   XML to allow the server **16** to format the results according to a

2   web application that can be executing on the subscriber server

3   **16**. For example, the XML output from the dictionary **18** can be

4   used in Extensible Stylesheet Language (XSL) stylesheets or other

5   web formatting options. Those with ordinary skill in the art

6   will recognize that many formats for the dictionary output can be

7   utilized, and the use of XML herein is provided for illustration

8   and not limitation. For example, in one embodiment, HTML

9   templates can be utilized to present search results directly to

10   an internet browser without requiring additional programming.

11   Other forms of SGML documents or other textual formats can be

12   used without departing from the scope of the techniques provided

13   herein. Alternately, search results can be presented graphically

14   using bar charts, pie charts, histograms, Excel compatible

15   spreadsheets, etc. Search results can also be saved as an Excel

16   compatible file for later analysis. Additionally and optionally,

17   the methods and systems herein can allow the search results to be

18   provided to an application through a variety of Application

19   Programmer Interfaces (APIs).

20   In some embodiments, the requested query information can

21   provide significant search results. The methods and systems

22   herein can provide the search results using a format that

25

1 includes categories and sub-categories from which a user at the

2 initiating device **12**, for example, can further select. Aggregate

3 data can also be presented with hyperlinks to detailed

4 information to allow users to retrieve further information

5 without providing further details, follow-up questions, etc.

6 Those with ordinary skill in the art will thus recognize that

7 although the methods and systems presented herein are provided

8 with respect to an internet illustration that includes browsers,

9 etc., other interfaces can be utilized to retrieve query

10 information and present query results.

11   A user or system manager associated with a server **16** can

12 provide or otherwise designate filtering schemes for providing

13 search results. A subscriber, for example, can determine to

14 exclude products from particular users based upon a received

15 profile (i.e., age, etc.). Those with ordinary skill in the art

16 will recognize that there are many parameters by which a

17 subscriber can filter or otherwise customize the search results.

18   The methods and systems can operate with security measures

19 that can be established by a system manager related to a server

20 **16**. For example, query information can be received or otherwise

21 associated with identity information. A dictionary **18** can be

1   configured to prevent the query information from being applied to

2   a data source for which the user is not allowed to otherwise

3   access.   In such an embodiment, the methods and systems herein

4   can be incorporated behind a firewall.

5   Those with ordinary skill in the art will recognize that the

6   methods and systems can also be practiced outside of a firewall.

7   In such an embodiment, a distributed or other search can be

8   performed across a network such as the internet or an intranet,

9   wherein accessibility to the data sources may not be protected by

10   a firewall. As indicated previously, search results can be

11   aggregated at the initiating device **12** or another remote device

12   for presentation to a user.

13   A dictionary **18** can also generate an output log that can be

14   understood to be a computer file that can be accessed by a system

15   administrator or other authorized individual or entity according

16   to the server **16** configuration or other authorization scheme.

17   The log file can be stored locally on the server **16** or another

18   memory device connected to the server **16** through a wired or

19   wireless network.   The log files can be configured to provide

20   data pertaining to received query information, customized search

21   queries, generated search results, query identity, data source

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1   identity, time of query, etc., with such examples provided only

2   for illustration. By editing the log file, a system

3   administrator can view the effectiveness of the dictionary with

4   respect to query information, desired results, security, etc.

5   Filters can be applied to the log files to provide log results

6   based on results generated, date, time of day, time period, etc.

7   In the illustrated embodiments, a system administrator or

8   other authorized user can edit a dictionary **18** to further

9   customize the dictionary **18**. Such edits can result from an

10   analysis of the log file, for example. Dictionary edits can also

11   be performed to further enhance business objectives. For

12   example, automated, scheduled searches can be performed to query

13   databases for stock information, etc. In an embodiment, an email

14   can be generated based on a search. For example, in an automated

15   search established by an administrator to verify stock quantity,

16   once a stock quantity reaches a predetermined value, an email can

17   be sent to the administrator and/or another interested party.

18   A system manager or other authorized user can also customize

19   a dictionary **18** and provide rules against which searches can be

20   performed and search results can be presented. For example, a

21   system manager can edit the dictionary to include a formula or

rule for determining a profit margin, and have results presented

in order of profit margin. Other rules could present results by

vendor, product availability, price, etc., with such examples

provided for illustration and not limitation. Such manual

customization of a dictionary **18** can be performed and applied

according to a particular user, or a group of users. The

dictionary editing can be performed locally or via a network.

In some practices of the systems and methods, system

requirements can provide for certain query information to be

provided. If the query information is not provided by the user

at the initiating device **12**, the user can be prompted to enter

the remaining information.

Accordingly, a dictionary **18** can include one or more of

relevant content and/or values from a data source **20**, a

representation of schemas, relationships, and category

hierarchies from the data source **20**, configuration settings

according to users and/or groups of users, business rules,

terminology definitions or specifications, synonyms, a language

translator, a natural language processor, an output data

formatter, and a log file generator.

29

1   The methods and systems herein can also allow for the

2   aggregation of customized query results from multiple data

3   sources and/or dictionaries. For example, as provided herein,

4   query information submitted at an initiating device **12** can be

5   broadcast to one or more dictionaries in broadcast or some other

6   sequenced manner, wherein the search results can be filtered or

7   otherwise aggregated at the System Server **14**. The filtering or

8   other presentation of information performed by the System Server

9   **14** can be performed additionally and optionally to filtering and

10   organization that can be performed at individual dictionaries **18**

11   and or servers **20**.

12   Referring now to FIG. 3, there is a diagram representing the

13   methods and systems in an embodiment that can be known as a query

14   translation embodiment **30**. In the FIG. 3 configuration, query

15   information can be presented to the system **32** through an API **33**

16   and to a query translator **34**. The query translator **34** can

17   translate the query information into a SQL statement, advanced

18   text search expression, HTTP call, etc, by accessing a dictionary

19   **18** that corresponds to a data source **20** to be searched. For the

20   FIG. 3 embodiment, a server **16** can provide the received query

21   information to the system **32** to receive from the system **32** via

22   the query translator **34**, a SQL statement, advanced text search

1   expression, HTTP call, etc. The server **16** can thereafter submit

2   or apply the returned search to a relational database, text

3   search engine, etc.

4   Referring to FIG. 4, there is a diagram of a configuration

5   **40** for the methods and systems that can allow the return of a

6   data set for formatting a search request, by an application that

7   can reside on the server **16** or another device. As indicated by

8   FIG. 3, query information can be provided by the server **16**. The

9   query information can include or be accompanied by a dictionary

10   selection, a user ID, business rules, etc., and a desired output

11   format to the system **42** through its API **33**. This interface can

12   be implemented using HTTP, Component Object Module (COM), Java,

13   Enterprise, Javabean, C, C++, Visual Basic, or another well-known

14   method. The natural language query, dictionary selection, and

15   output format can be input to a query processor **44** that includes

16   a data access module **46** that transfers the query information and

17   dictionary selection to a query translator **34**. The query

18   translator **34** can utilize the specified dictionary **18** and query

19   information to generate a customized query as provided herein.

20   Those with ordinary skill in the art will recognize that although

21   FIG. 4 depicts a single dictionary **18** and query translator **34**,

22   the embodiment of FIG. 4 can include multiple dictionaries and/or

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1   query translators. The customized query can be transferred to

2   the data access module **46** that can issue the customized query to

3   the data source **20** corresponding to the query. FIG. 4

4   demonstrates two data sources **20** that include a relational

5   database management system **20a** and a text search engine **20b**,

6   although other data sources can be utilized and specified. The

7   customized query search results can be returned to the data

8   access module **46** and thereafter transferred to the formatting

9   module **48** with the specified output format. The formatting

10   module **48** can format the query results based on the specified

11   format, and transfer the formatted output to the server **16**

12   through the API **33**. In an embodiment, the formatted results can

13   be transferred to the server **16** in XML format. A web application

14   on the server **16** or another location can transform the XML search

15   results into a desired presentation style using, for example, the

16   W3C standard extensible stylesheet language transformation (XSLT)

17   and HTML.

18   Referring to FIG. 5, there is a diagram for an embodiment **50**

19   where the search results can be presented to a server application

20   in a ready-to-display format. As was shown in FIG. 4, in FIG. 5,

21   a server **16** can provide query information, dictionary selection,

22   and output format to the data access module **46** of the query

32

1   processor **44**. The data access module **46** can provide the query

2   information and dictionary selection to the query translator

3   module **34** that utilizes the specified dictionary **18** to generate a

4   customized search or query. The customized search can be

5   provided to the data access module **46** and executed against the

6   appropriate data source **20**. The results of the search can be

7   returned to the formatting module **48** via the data access module

8   **46**, with the specified output format. The formatted search

9   results can be provided to the server **16** for display. In the

10   illustrated system of FIG. 4, the formatted results can be fully

11   customizable HTML templates for output to the internet, and can

12   include colors, headers, footers, and other customizable

13   characteristics to match the web site. The HTML can additionally

14   and optionally include graphs, pie charts, bar graphs, reports,

15   and spreadsheets that can be displayed using, for example,

16   ActiveX control or Java applet.

17   As indicated with reference to FIG. 4, the system and

18   methods according to FIG. 5 can be practiced with multiple query

19   translators **34** and/or dictionaries **18**. Additionally, the data

20   sources **20a, 20b** can be multiple and can include other data

21   sources than illustrated. In the embodiments herein, although

33

1   identification can be provided with a query request, some

2   embodiments may not utilize query information.

3   Referring now to FIG. 6, there is shown an embodiment **60**

4   wherein a "broker dictionary" **18e** can be utilized to interface to

5   other dictionaries and data sources. One of ordinary skill in

6   the art will recognize from the description of the methods and

7   systems provided herein, that a server **16** that is not

8   illustrated, can be associated with the broker dictionary **18e**.

9   The illustrated broker dictionary **18e** can include, for example,

10   URLs of other servers at different locations in a local or other

11   network (e.g., internet, intranet, LAN, WAN, etc.) that have

12   relevant data sources and/or dictionaries. Dictionaries to which

13   the broker dictionary **18e** can communicate can be referred to

14   herein as broadcast dictionaries. In an embodiment, the broker

15   dictionary **18e** can provide an interface for a subscriber **16** with

16   multiple servers. The multiple servers can maintain different

17   customized dictionaries, or can share the broker dictionary **18e**.

18   In some embodiments, the broker dictionary **22** can interface to

19   multiple subscribers **16** and/or data sources **20**.

20   According to the FIG. 6 system, the broker dictionary **18e**

21   can receive query information from the initiating device **12** and

34

1   the broker dictionary **18e** can filter the search request to

2   eliminate broadcast dictionaries and/or data sources **20** that do

3   not include data relevant to the query information. The broker

4   dictionary **18e** can therefore include sophisticated and

5   intelligent filters to eliminate unneeded broadcast search

6   requests. Those with ordinary skill in the art will recognize

7   that the broker dictionary **18e** can include the attributes

8   previously provided to dictionaries in general, including but not

9   limited to language translation, synonym generation, natural

10   language processing, business rules, etc.

11   The broker dictionary **18e** can relay or broadcast query

12   information, as processed by the broker dictionary **18e**,

13   unprocessed, or a combination thereof, to the selected broadcast

14   dictionaries **18f, 18g, 18h** and other data sources **20e, 20f, 20g**.

15   For example, in the illustrated system of FIG. 5, the broker

16   dictionary **18e** can process the query information to provide a

17   customized query that can be provided to the non-broadcast

18   dictionary data sources **20e, 20f, 20g**. Similarly, the broadcast

19   dictionaries **18f, 18g, 18h** can receive either the customized

20   query information or the original query information from the

21   initiating device **12**. In either case, the broadcast dictionaries

22   **18f, 18g, 18h** can process the received query information from the

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1 broker dictionary **18e**, and distribute a customized query to one

2 or more data sources **20h, 20i, 20j** as provided previously herein.

3 The customized query results from the different data sources

4 **20e-20j** can be transmitted or otherwise transferred to the broker

5 dictionary **18e**. The illustrated broker dictionary **18e** can

6 receive customized query search results and format the results to

7 present a single result package to the initiating device **12** or

8 other server **16** or application as provided herein. In some

9 embodiments, the broker dictionary **18e** can filter the search

10 results before transferring or communicating the search results

11 as provided herein.

12 Those with ordinary skill in the art will recognize that the

13 systems and methods herein can include one or more databases that

14 can be in communication with the servers **16** but are not otherwise

15 illustrated in the representative figures. For example, a

16 database can be utilized to maintain information based on user

17 identity and privileges, broker dictionaries and associated

18 broadcast dictionaries, rules for filtering query results, etc.

19 Accordingly, it can be understood that the methods and

20 systems disclosed herein can be applied to a variety of queries.

21 For example, the query information initially submitted can be a

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1   question, such as "How far is bank XXX from home?", such that

2   data pertinent to the user (e.g., "home") and data related to a

3   another sensor or entity (e.g., mapping program or distance

4   calculator) can be integrated with the query information to

5   provide an appropriate response. Questions can be presented in

6   succession, and results from one question can be a basis as input

7   to the dictionary for subsequent questions.

8   The techniques described herein are not limited to a

9   particular hardware or software configuration, and may find

10   applicability in many computing or processing environments. The

11   techniques can be implemented in hardware or software, or a

12   combination of hardware and software. The techniques can be

13   implemented in one or more computer programs executing on one or

14   more programmable computers that include a processor, a storage

15   medium readable by the processor (including volatile and non-

16   volatile memory and/or storage elements), one or more input

17   devices, and one or more output devices.

18   The computer program(s) is preferably implemented in one or

19   more high level procedural or object-oriented programming

20   languages to communicate with a computer system; however, the

1   program(s) can be implemented in assembly or machine language, if

2   desired. The language can be compiled or interpreted.

3   The computer program(s) can be preferably stored on a

4   storage medium or device (e.g., CD-ROM, hard disk, or magnetic

5   disk) readable by a general or special purpose programmable

6   computer for configuring and operating the computer when the

7   storage medium or device is read by the computer to perform the

8   procedures described herein. The system can also be considered

9   to be implemented as a computer-readable storage medium,

10   configured with a computer program, where the storage medium so

11   configured causes a computer to operate in a specific and

12   predefined manner.

13   One potential advantage of the methods and systems is that

14   an internet user may obtain reliable, accurate, and efficiently

15   organized information in response to a search or query request.

16   What has thus been described is a method and system for

17   providing efficient searching of devices on communications

18   networks, such as servers on the internet, using an application

19   that can survey a subscriber's server that can include a catalog

20   and database, and use the formatting information and data from

21   the survey to create a dictionary customized to the subscriber's

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1   data sources. A user seeking information can initiate a search

2   from an initiating device using keywords, natural language terms,

3   connectors, expressions, etc., wherein such query information can

4   be transmitted to various subscriber customized dictionaries.

5   The customized dictionaries can customize the query based on

6   respective subscriber databases and text documents, text search

7   engines, etc., to produce an accurate search result. The search

8   results can be filtered and integrated for presentation to the

9   initiating device. Search results can be customized using user

10   preference or profile information.

11   Although the methods and systems have been described

12   relative to specific embodiments thereof, the methods and systems

13   are not so limited. Obviously many modifications and variations

14   may become apparent in light of the above teachings. For

15   example, although the illustrated embodiment presented herein

16   related to the internet, the methods and systems can be applied

17   to searching other devices on other communications networks.

18   Although HTML and XML languages were utilized to facilitate the

19   searching, other languages may be utilized. The survey program

20   can be run locally on a server, or remotely from another

21   platform. Similarly, a dictionary can be accessed and/or managed

22   locally or remotely using wired or wireless communications

1 systems and methods. Results of customized queries can be

2 aggregated at a server having multiple data sources, and

3 thereafter transferred to the system server that can aggregate

4 the results. In another embodiment, an application residing on

5 the initiating device can receive and aggregate the results for

6 presentation on the device. In an embodiment, search results can

7 be displayed according to a user identification and/or

8 information stored in a central database or local memory that

9 includes user-specific preferences. The preferences can indicate

10 suppliers, price, and other search-relevant criteria that can be

11 submitted with the natural language search terms. In embodiments

12 utilizing a user account for preferences, the respective

13 subscriber dictionaries can integrate the user's preferences with

14 the search terms to increase the probability of satisfying a

15 search query for a user. In another embodiment, a user can be

16 prompted for preference criteria, while in another embodiment,

17 user identification data can be entered and submitted with the

18 search criteria. Upon receiving the user identification data, a

19 dictionary can cause a pre-stored user profile to be extracted

20 and incorporated into the search.

21 In some embodiments, a user can be presented with search

22 results and can select the desired results for purchase. Search

1   results can be accompanied by a URL of the order processing

2   system that can be used to order the product; and, when the user

3   selects the item, the relevant product information can be

4   submitted to the purchasing system to initiate the purchase

5   process. In an embodiment, the user's selection of a product can

6   provide a transition to an order basket or other ordering scheme

7   that can be provided by the initiating website, the subscriber's

8   website, or an alternate website. In these embodiments, the

9   ordering scheme can interface to a browser or other interface at

10   the initiating device.

     Data sources and dictionaries do not have to reside on the

12   same server, medium, etc. Additionally, methods of presenting a

13   query and presenting query results can be integrated with instant

14   messaging and/or email.

     Many additional changes in the details, materials, and

16   arrangement of parts, herein described and illustrated, can be

17   made by those skilled in the art. Accordingly, it will be

18   understood that the following claims are not to be limited to the

19   embodiments disclosed herein, can include practices otherwise

20   than specifically described, and are to be interpreted as broadly

21   as allowed under the law.